

An Analysis on the Non-Performing Assets of Public Sector Banks in India

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ABSTRACT

The objective of this study is to analyse the impact of Priority Sector Lending (PSL) on Non-Performing Assets (NPAs) of Public Sector Banks (PSBs) in India. Further, the study investigates the impact of NPAs of PSBs in India on Gross Advances (GAs) and Net Profitability. The paper also examines the presence of structural break in the relationship between GAs and NPAs of PSBs due to the Financial Crisis, 2007-08. The results show that PSL has a significant impact on NPAs of PSBs. There is a negative impact of NPAs on GAs and NP of PSBs. There is structural break in the relationship between GAs and NPAs due to financial crisis.

KEYWORDS: *Non-Performing Assets, Public Sector Banks, Gross Advances, Priority Sector Lending, Financial Crisis*

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INTRODUCTION

According to RBI, A Non-Performing Asset (NPA) was defined as a credit facility in respect of which the interest and/ or instalment of principal has remained 'past due' for a specified period of time.

Every nation depends on their financial stability. The banks provide various schemes of loans and advances to boost the economy and to do welfare for the nations. When the banks provide financial help, they should focus on the riskiness of cash flows associated with it, timing and magnitude of the project. If any of them travels in the wrong directions, it will be termed as NPAs.

Today, about 70% of the total banking industry in India are government owned and they are called Public Sector Banks. The Indian Public Sector Banks have huge debt which are Non-Performing Assets that is increasing year on year. As of July 2020, after recent mergers of government banks, there are a total

of 12 nationalized banks in India and RBI is the governing body that manages these nationalized banks. Non-performing asset is a loan in which interest payment is overdue for a period of 90 days.

Objectives of the Study

- To study the composition of NPAs in public sector banks and analyse the impact of priority sector lending on gross NPAs of these banks.
- To examine the effect of asset delinquencies on the key performance indicators of public sector banks such as profitability and credit growth.
- To test the presence of structural break in the relationship between gross NPAs and gross advances of public sector banks due to financial crisis, 2008-09.

Theoretical Background

Diksha Sahni and Dinesh Chandra Seth¹(April 2017) in their study “Non-Performing Assets in Indian Commercial Banks” evaluates the effect of NPA in public and private sector banks. The dimension of NPA is comparatively higher in public sector banks as compared with private sector banks. To improve the efficient growth and profitability of banks NPA needs to be reduced and controlled. The authors also suggest some curative measures to reduce NPAs in their study.

K Murugan² (Sept 2020) on the research article " Status of NPAs and their impact on the public sector banks and the economy in India" examined the status of NPAs and found out that the NPAs are a serious threat to the Indian economy for the past two decades. They finally made a conclusion that the public sector banks should develop skills and practice towards credit and risk management.

SC Sharma and Bhavna Chhabra³(2017) in their study on “The Problem of NPAs: Some facts Relating to Commercial Banks in India” tries to understand the growth of NPA and the reasons behind the extent of its spread across sectors. It clarifies the large-scale level investigation among different factors like GDP, Credit Growth and Gross NPA.

Suryanarayan Mohapatra⁴ et al. (2019) in their research paper named "Intellectual capital and firm performance evidence from the Indian banking sector" states that after 2008, the financial crisis of Indian banking was paralysed and the cases of NPAs increased.

Research Methodology

The data for a period of 16 years has been collected from RBI reports and Money control. The analysis has been done using R Studio and SPSS. The econometric tools of linear regression analysis and Chow test have been used.

Analysis and Discussion

NPAs and Sector-wise Lending of Public Sector Banks

The sector wise lending of PSBs can be broadly classified into priority sector lending, non-priority sector lending and public sector lending. One of the relevant arguments raised in the case of the NPAs of Indian public sector banks is that the Priority sector lending led to increase in NPAs. To examine this, the researcher compares NPAs of the priority sector against non-priority sector loans. The following table shows the composition of NPAs in public sector banks.

Table 1 Composition of NPAs in PSB (2001-13)(in Rs. Billion)

Year	Priority sector	Non-priority sector	Public sector	Gross NPA
2001	241.56	278.54	11.63	570.80
2002	251.50	283.71	9.02	560.90
2003	249.38	267.81	10.87	559.37
2004	238.40	256.98	6.10	602.99
2005	233.97	229.69	4.50	558.58
2006	223.74	180.72	9.32	523.68
2007	229.54	148.61	4.90	404.52
2008	252.87	140.15	2.99	449.57
2009	241.68	193.90	4.74	599.26
2010	308.46	259.23	5.24	746
2011	412.87	295.15	2.78	1178.39
2012	562.01	560.71	2.17	1656.06
2013	669.28	888.53	1.08	2280.74

Source: Department of Banking Supervision, RBI

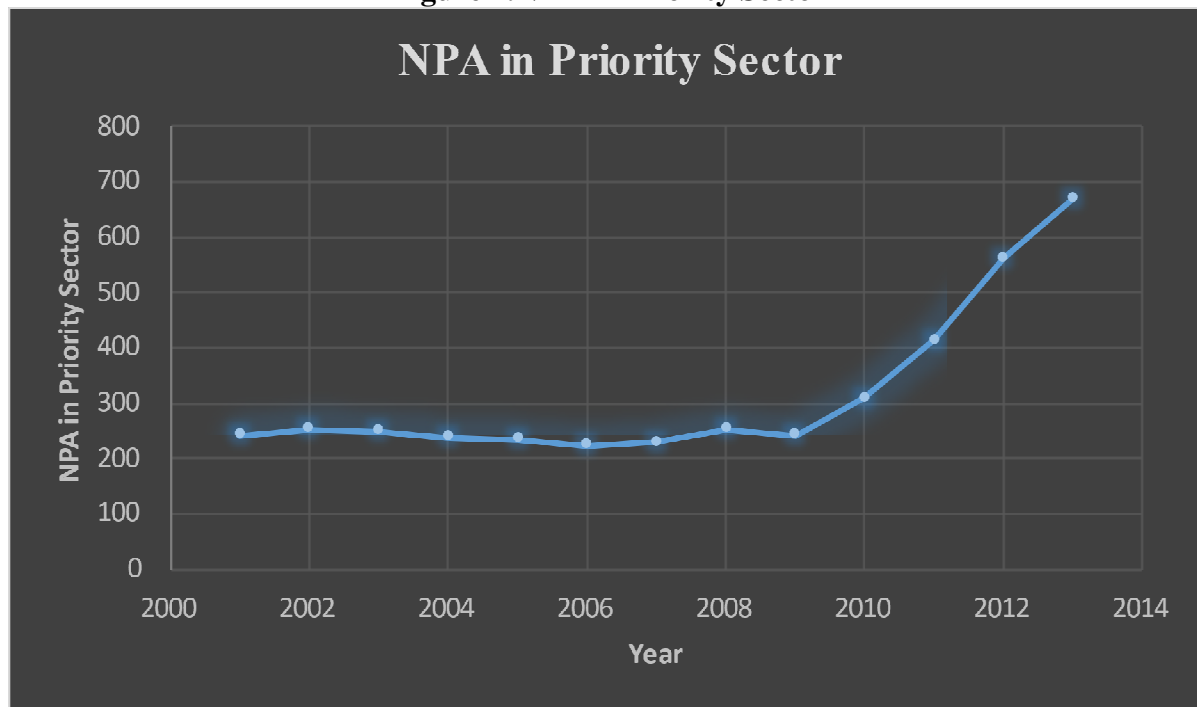
Since, 40 percent of the total advances of PSBs is composed of priority sector lending, their share in GNPA are much higher than non-priority sector and public sector lending.

¹Diksha Sahni and Dinesh Chandra Seth

²K Murugan

³SC Sharma and Bhavna Chhabra

⁴Suryanarayan Mohapatra

Figure 1.NPA in Priority Sector

The NPA composition in priority sector lending has been more or less stable till 2009. There has been a tremendous rise in NPA in priority sector after the financial crisis 2008-09.

The study used the following general linear model;

$$GLNPA = \beta_0 + \beta_1 LPSL + \beta_2 LNPSL + \beta_3 LPSL + U_i \text{ ----- (1)}$$

Where,

LG NPA = log of gross non-performing assets of public sector banks in India.

LPSL = log of share of priority sector lending in gross NPAs of PSBs.

LNPSL = log of share of non-priority sector lending in gross NPAs.

LPSL = log of share of public sector lending in gross NPAs.

U_i = stochastic error variable.

Ho: There is no significant relationship between NPA in priority sector lending and GNPA.

Ha: there is significant relationship between NPA in priority sector lending and GNPA.

The results were computed using R language.

Result

The following are the results of regression analysis.

Coefficients

	Estimate	Std Error	t value	Pr(> t)
(Intercept)	-0.864269	1.181880	-0.731	0.48322
LPSL	1.010101	0.303831	3.325	0.00888 **
LNPSL	0.303165	0.151902	1.996	0.07707
LPSL	-0.005975	0.092251	-0.065	0.94977

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
 Residual standard error: 0.1021 on 9 degrees of freedom
 Multiple R-squared: 0.9709, Adjusted R-squared: 0.9612
 F-statistic: 100.2 on 3 and 9 DF, p-value: 3.113e-07

Interpretation

There is a significant relationship between LG NPA and LPSL. There is a positive relationship between priority sector lending, nonpriority sector lending and LG NPAs. There is a negative relationship between public sector lending and LG NPAs. 97% of changes in the LG NPA are due to changes in LPSL, LNPSL and LPSL.

NPAs and Performance Indicators of PSBs

To understand the impact of NPAs on the performance of PSBs two key indicators have been selected; net profits and gross advances. The following two general linear models have been built for analysing the data.

$$GA = \beta_0 + \beta_1 GNPA + U_i \text{ -----(2)}$$

Where,

GA = rate of growth of gross advances of public sector banks from 2001-02 to 2015-16.

GNPA= gross NPAs of public sector banks as a percentage of gross advances from 2001-02 to 2015-16.

U_i = stochastic error term

The following table shows the rate of growth of gross advances as well as GNPA as percentage of gross advances.

Table 2 Gross Advances and Gross NPAs of PSBs (2001-15) (in percent)

Year	Growth rate of GA	GNPA
2001-02	12.61	11.1
2002-03	11.84	9.4
2003-04	11.69	7.8
2004-05	28.46	5.5
2005-06	29.03	3.6
2006-07	30.15	2.7
2007-08	24.95	2.2
2008-09	27.05	2.0
2009-10	19.87	2.2
2010-11	23.75	2.4
2011-12	17.19	3.6
2012-13	15.27	4.4
2013-14	14.43	4.2
2014-15	7.34	5.3
2015-16	1.99	4.7

Source: computed using data from RBI and www.Moneycontrol.com

H_0 : There is no significant relationship between GA and GNPA.

H_a : There is significant relationship between GA and GNPA.

Result

The following are the results of regression analysis using SPSS.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.525 ^a	.275	.220	7.61695
a. Predictors: (Constant), GNPA as a percentage of GA				

Coefficients

Model	Unstandardized coefficient		Standardized coefficient	T	Sig.
	B	Std. Error	Beta		
(constant)	26.190	4.028		6.502	.000
GNPA as a Percentage of GA	-1.649	.742	-.525	-2.223	.045

a. Dependent Variable: GA growth rate

Interpretation

Since calculated t-value is greater than the critical t-value at 5 percent level of significance, it is evident that GNPA as a percentage of GA is statistically significant. 1 percent change in GNPA of public sector banks leads to 1.65 percent change in the GA of public sector banks. There is an inverse relationship between GA growth rate and GNPA. As GNPA increases as a percentage of GA, GA falls. Hence increasing NPAs of public sector banks lead to declining credit growth. 27.5 percent of change in GA is due to change in GNPA in public sector banks.

$$NP = \beta_0 + \beta_1 GNPA + U_i \text{ -----(3)}$$

Where,

NP = rate of change in net profits of public sector banks from 2001-02 to 2015- 16.

GNPA = rate of change in gross non-performing assets of public sector banks from 2001-02 to 2015- 16.

NPA's play a vital role in declining profitability of public sector banks. Therefore, it is necessary to study the impact of NPA's on the profits of these banks. The following table shows the data on rate of change in GNPA and net profits of public sector banks.

Table 3 Rate of Change in Net Profits and Gross NPAs of PSBs (2001-15)

Year	Rate of change in net profits (%)	Rate of change in GNPA (%)
2001-02	69.82	-11.02
2002-03	50.66	-22.27
2003-04	41.39	-13.92
2004-05	-8.81	1.57
2005-06	5.62	-13.83
2006-07	21.30	3.97
2007-08	32.83	17.76
2008-09	30.16	17.92
2009-10	14.16	71.15
2010-11	12.63	64.97
2011-12	12.40	51.59
2012-13	2.62	45.07
2013-14	-27.11	65.36
2014-15	1.04	23.61
2015-16	-149.62	106.12

Source: computed using data from RBI and Moneycontrol

H_0 : There is no significant relationship between NP and GNPA.

H_a : There is significant relationship between NP and GNPA.

Result

The following are the results of regression analysis.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of The Estimate
1	.725 ^a	.526	.490	35.49315
a. Predictors: (Constant), rate of change in gross npa				

Coefficients

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	32.819	11.366		2.887	.013
	Rate of change in gross NPA	-.939	.247	-.725	-3.799	.002
a. Dependent Variable: rate of change in net profits						

Interpretation

Since calculated t-value is greater than the critical t-value at 1 percent level of significance, it is evident that GNPA is statistically significant. 1 percent change in GNPA's of public sector banks leads to 0.9 percent change in the NP of public sector banks. There is an inverse relationship between NP growth rate and GNPA's. As GNPA increases, NP falls. Hence increasing NPA's of public sector banks lead to declining rate of growth of profits. 52.6 percent of change in NP is due to change in GNPA's in public sector banks. There is a high negative correlation between net profits and GNPA's.

Test for Structural Break between Gross NPAs and Gross Advances of PSBs due to Financial Crisis

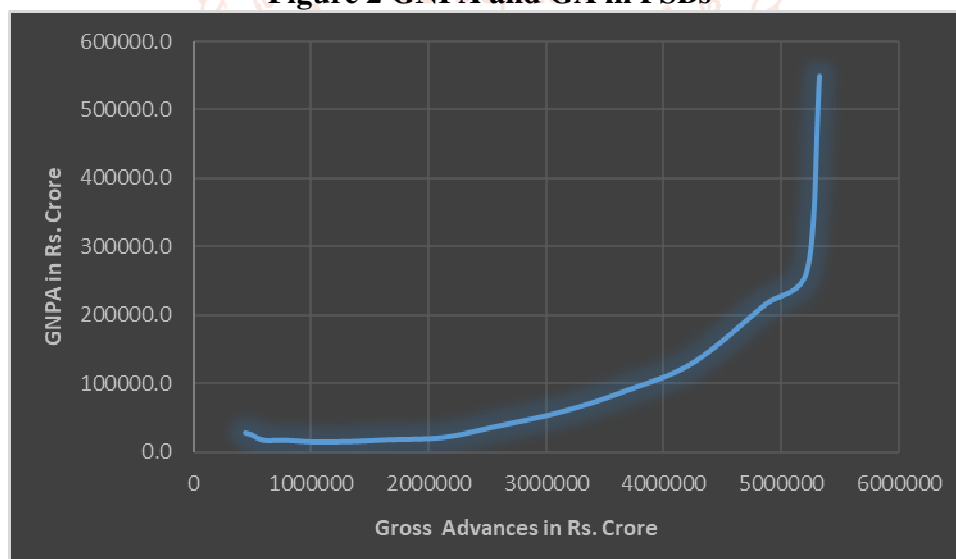
The banking sector in India underwent major changes in their structure due to global meltdown in 2008-09. The financial crisis has exerted pressure on Indian bank's profitability and capital.

Test for structural break or parameter stability has been conducted to identify whether there is a structural break in the data of gross non-performing assets from 2001 to 2016. It has been assumed that the structural break would have occurred in the year 2008 due to global financial crisis. The following table shows GNPA as well as gross advances of public sector banks for 16 years. It is evident that there was a fall in GNPA of public sector banks from 2005 to 2008 and a rise in GNPA after 2008.

Table 4 Gross Advances and Gross NPAs of PSBs

Year	GNPA in Rs. Crore	Gross advances in Rs. Crore
FY01	27958.0	440264.56
FY02	24877.0	495791.28
FY03	19335.0	554520.68
FY04	16642.0	619352.02
FY05	16904.0	795656.25
FY06	14566.0	1026698.04
FY07	15145.0	1336268.83
FY08	17836.0	1669713.78
FY09	21033.0	2121379.58
FY10	36000.0	2543012.95
FY11	59391.0	3147072.78
FY12	90036.0	3688076.34
FY13	130624.0	4251583.0
FY14	216000.0	4865291.91
FY15	267000.0	5222654.08
FY16	550346.0	5326777.67

Source: RBI and www.moneycontrol.com

Figure 2 GNPA and GA in PSBs

The figure clearly shows that there is an increase in GNPA and GA in public sector banks after the financial crisis in the year 2008-09.

CHOW test has been done to check the existence of parameter instability in the data set by dividing the whole data into three linear regressions models as follows;

Pooled Regression (2001-2016)

$$Y_t = \beta_0 + \beta_1 X_t + U_t \text{ -----(4), } n = 16$$

Pre-financial Crisis (2001-2007)

$$Y_t = \alpha_0 + \alpha_1 X_t + U_t \text{ -----(5), } n_1 = 7$$

Post-financial Crisis (2008-2016)

$$Y_t = \gamma_0 + \gamma_1 X_t + U_t \text{ -----(6), } n_2 = 9$$

Where,

Y_t = GNPA of public sector banks

X_t = gross advances of public sector banks

U_t = stochastic error term

Linear regression model (4) is the restricted model which assumes that there is no structural break between the two time periods. It assumes there is parameter stability in the data assuming that the intercept as well as slope coefficient remains the same for the entire period. On the other hand, models (5) and (6) are unrestricted models. They assume that n_1 and n_2 are different in terms of intercept and slope coefficients.

H_0 : There is no structural break or parameter stability exists.

H_1 : There is structural break or parameter instability exists.

Result

The following are the results of regression analysis.

ANOVA						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.959E11	1	1.959E11	24.190	.000 ^a
	Residual	1.134E11	14	8.098E9		
	Total	3.093E11	15			

a. Predictors: (Constant), GA, b. Dependent Variable: GNPA

$$RSSR = 1.134E+11 \text{ -----(a)}$$

ANOVA						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.087E7	1	9.087E7	6.715	.049 ^a
	Residual	6.766E7	5	1.353E7		
	Total	1.585E8	6			

$$RSSUR1 = 6.766E7 \text{ -----(b)}$$

ANOVA						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.621E11	1	1.621E11	15.070	.006 ^a
	Residual	7.531E10	7	1.076E10		
	Total	2.374E11	8			
a. Predictors: (Constant), GA2						
b. Dependent Variable: GNPA2						

$$RSS_{UR2} = 7.531E+10 \text{ -----(c)}$$

CHOW test is computed using F- ratio.

$$F = \frac{[RSSR - (RSSUR1 + RSSUR2)]/K}{(RSSUR1 + RSSUR2)/(n1 + n2 - 2k)}$$

Where,

K = number of parameters (there are two parameters in this model).

From (a), (b), and (c),

$$|F| = 4.2876$$

The critical F-value is as follows;

$$F_{\alpha=0.05, 2, 17 \text{ df}} = 3.59$$

Since, $|F| > F_{\alpha=0.05, 2, 17 \text{ df}}$, we reject the null hypothesis and conclude that there is structural break or parameter instability in the data due to financial crisis in 2008-09.

Findings and Conclusion

- There is a significant impact of PSL on GNPA of PSBs.
- We find that there is an inverse relationship between GA growth rate and GNPA. As GNPA increases as a percentage of GA, GA falls. Hence increasing NPAs of public sector banks lead to declining credit growth. And also, there is an inverse relationship between NP growth rate and GNPA.
- There is a structural break in the relationship between gross NPAs and gross advances of public sector banks due to financial crisis, 2008-09.

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